Comments of Wind Industry on Phase 1A Draft Report Prepared by Black & Veatch for the California Renewable Energy Transmission Initiative (RETI)[1]

In the following the wind industry presents its comments on Phase 1A draft report prepared by the Black and Veatch Corporation for the California Renewable Energy Transmission Initiative (RETI). The wind industry's comments are presented in three different categories:

I. General comments on RETI's goals;

II. Comments on the methodological aspects of the Phase 1A draft report; and

III. Specific comments on the details of the Phase 1A draft report.

General Comments on RETI's Goals:

The wind industry believes that RETI's goal should be to develop processes and information, as outlined in these comments, that can facilitate the development of cost effective transmission infrastructure to broadly support renewable energy resources for California rather than attempting to develop specific transmission infrastructure plans of its own to access particular renewable energy resources.[2] The wind industry believes that our recommended goals can be readily achieved by identifying all promising competitive renewable energy zones (P-CREZs) in and around CA using methodologies that are generally in line with the one presented in the B&V Phase 1A draft report, *but which recognize the inherent uncertainties in the Ranking Cost values*. The P-CREZ information should be made available to transmission planning bodies for use in the development of their long-term transmission plans. The same information should be provided to entities that determine the need and authorize rate recovery for transmission infrastructure in California so that they can streamline their approval process for transmission expansion plans that support renewable energy development in California. More specifically, we recommend that RETI foster the policies and processes that would mandate that:

- The California Energy Commission or the California Public Utilities Commission (CPUC) updates P-CREZ information on regular basis – no later than once every two years.
- The California Independent System Operator (CAISO), in coordination with its Participating Transmission Owners (PTOs), as well as the Publicly Owned Utilities (POUs) use the information on P-CREZs in their Transmission Planning Processes (TPPs) to proactively plan for transmission grid expansion in and, to the extent applicable, around their service territories to facilitate the development of such P-

[1] These comments are compiled by Dariush Shirmohammadi who represents California's wind industry on the RETI Stakeholders Steering Committee (SSC). These comments are the collective comments of the wind industry and do not necessarily represent the views of Dariush Shirmohammadi or Oak Creek Energy Systems which has retained the services of Dariush Shirmohammadi as a consultant to represent the wind industry's interests on RETI.

[2] We have presented components of these comments on RETI on a number of occasions in the past. However, we would like to use this opportunity to formally present our consolidated comments on this occasion.

CREZs. In this context, the transmission expansion plan should account for all the reliability needs and economic opportunities of the grid and the interconnection of all generation projects with signed interconnection agreements, in addition to proactive planning for the P-CREZs. Such expansion plans should be for the backbone system only allowing the development of whichever projects survive the competitive resource procurement and the siting processes. Backbone upgrades will also provide multiple system benefits and can built in stages such that if the projected resource development in a P-CREZ does not materialize, the transmission development could be scaled down.

- The CPUC, CEC and other regulatory bodies responsible for permitting transmission route development should use information on P-CREZs to significantly streamline the approval of permit applications for transmission projects that are intended to interconnect renewable resources in such P-CREZs. More specifically, these bodies should adopt the need determinations made by the CAISO (or POUs) for any transmission project that will support the development of P-CREZs as a rebuttable presumption and focus their efforts for such transmission projects on environmental review of the transmission route.
- Assuming that the project ranking costs reflect a range of values that reflect the underlying cost variables, the CPUC could use RETI's results as one of a number of possible reference points for high level screening the reasonableness of a PPA price. However, as the RETI analysis is very general in nature, this reference point should not substitute for a third-party consultant's analysis of a specific project's costs. The underlying data is not specific to any given project and the data is likely to become stale within a short time period as project costs change in the open market.

Comments on Methodological Aspects of the RETI Phase 1A Draft Report:

In line with the specific goals articulated above, the wind industry believes that it is critical that P-CREZs be identified widely based on project and transmission costs that reflect the inherent uncertainties of those costs rather than attempting to prioritize specific projects based on a single numerical figure. Only in this fashion will the transmission project tied to a P-CREZ have a good chance of being developed subject to proper staging plans. Such a transmission project, since it will be a backbone facility, can offer multiple benefits to the ratepayers that cover its cost. The other very critical benefit of an expansive P-CREZ ranking is that it is consistent with the principles of competitive resource procurement process and the Federal Open Access Transmission Tariffs as it would provide access to any of numerous potential renewable resource projects.

A transmission expansion plan developed in this fashion will be far superior to the one that is expected to involve several specific trunk lines, shared or otherwise, for a number of small renewable energy zones such as those that are envisioned in the RETI Phase 1A draft report. The scenario promoted in the Phase 1A study report is expected to lead to transmission projects that are costly and offer no system benefits other than interconnecting speculative resources in a small zone. Furthermore, the plan for development of such radial trunk lines can readily falter as even a small error in predicting the development of a

renewable resource is likely to lead to scrapping the plans to develop one or more trunk lines; hence affecting many viable projects that share the need for such trunk lines. Finally, we believe that the identification of small renewable energy zones will offer existing projects in such zones tremendous market power that cannot be mitigated through the competitive resource procurement process. This outcome will also prompt those who control the land in selected small zones to have unmitigated market power for the cost of the land leading to a complete distortion of the competitive resource procurement process.

Hence, we strongly recommend that any effort to develop and prioritize small renewable energy zones (one with few identified or assumed projects), as presented in the B&V Phase 1 draft report, to be abandoned in favor of developing larger P-CREZs that include all projects that are within the same economic range – please note that the goal is not necessarily expanding renewable zones geographically, but including all potentially cost effective renewable projects that could share capacity on a new or upgraded backbone transmission system.

Fortunately, we believe that the basic methodology presented by B&V for determination of renewable energy zones readily lends itself to the outcome that we are recommending here. In that context, all that is needed to achieve the goal of identifying larger P-CREZs is to account for the fact that the majority, if not all, of the data used to calculate the "Ranking Cost" for each specific project (Ranking Costs are later used to create zones) are inherently uncertain. Among input data uncertainties we can readily enumerate the following:

- The wind resource maps used for the B&V evaluation are far less accurate than developers' met data (B&V notes this point generally; specifically, these models are accurate only within a wide margin of error, e.g., +/- 3 m/s).
- Per B&V, the wind capital costs alone has a ~23% range ($1,900-$2400/kW).
- The transmission cost component will be a "screening level" assessment based on publicly available information, as opposed to the more accurate (though still approximate) assessments that the CAISO will conduct under its reformed LGIP process, and the actual transmission plans that the CAISO will develop in its transmission planning process (TPP).
- According to the B&V report, the Capacity Value of a project is calculated based on its ability to provide dependable and reliable capacity during summer peak periods: "Capacity Credit." For example, based on B&V report the capacity credit for new wind resources in the Southern California Edison territory would be 23 percent. Using a single Capacity Credit value for all new wind generators in Southern California Edison territory would misrepresent the actual values associated with specific projects and generator technologies employed.
- According to the B&V report, the Energy Value of a project is calculated based on a market price forecast for that energy developed using a production simulation model. The results of any production simulation model are dependent on numerous factors, each of which can readily vary over a wide range during the life of a project – hence there will be high uncertainty (variability) involved in the price forecast from such a simulation. For this reason, and to capture the values that the utilities use in their RPS bid evaluation methodologies, a range of values should be used.

- Military exclusion maps (which may be used in Phase 2) indicate "red" (no-development) areas even though negotiations with the military may enable development.

Hence, we strongly recommend that the calculation of Ranking Cost for the renewable projects be handled through a statistical analysis (potentially Monte-Carlo based simulations) leading to the calculation of a range of values for the Ranking Cost for each project – with mean and standard deviation values. Projects whose Ranking Cost Ranges overlap could then be combined to create one or more CREZs at the same ranking level. This is not only a desirable outcome, but also is consistent with the principles of a sound analytical methodology for evaluating and using the Ranking Cost when the underlying data is uncertain. Furthermore, we do not believe that the projects' commercial operation date (COD) should be used as a criterion to further reduce the size of renewable energy zones as presented in the Phase 1A draft report. Instead, we recommend that the COD information be used to stage the deployment of a backbone transmission line planned for a P-CREZ.

Finally, regarding the screening that the RETI environmental subgroup is envisioning, we recommend that the environmental screening be done separately from the ranking process and that the results not be included in the RETI report. While it could be very useful for developers to have a broad assessment of the relative environmental sensitivities of different areas, it would be inappropriate to include the screening in the ranking report given the approximate nature of the assessment and the conflict with established processes for determining environmental impacts. The environmental assessment could be compared to the transmission solutions identified by the CAISO under the approach recommended above; if the identified solutions would provide access to enough "environmentally preferred" renewable energy projects to meet state goals (even if they would also provide access to less preferred projects), then the solutions should be supported by the environmental subgroup. Environmental groups can then participate in local processes to support or oppose particular projects.

Specific Comments on Details of the RETI Phase 1A Draft Report:

In the following we present very specific questions and comments on the RETI Phase 1A draft report. These comments have been partially compiled based on input from individual wind industry representatives and may not necessarily represent a consistent picture.

1. The report states that:

   > *"To the extent possible, RETI will use information about actual projects in this analysis. Where those projects are not sufficient to exploit the identified resource, RETI will use generic information to develop additional hypothetical, but realistic, projects."*

   We ask that B&V specify the criteria that it intends to use to determine the developability of the "identified resources" in a zone.

2. The report states that:

   > *"Renewable resources will be aggregated into CREZs based on their transmission requirements, economics, and resource characteristics."*

However, the report goes on to bunch projects in CREZs based solely on their geographic proximity to existing substations. We would like for B&V to clarify the underlying distinction, if any.

3. The report states that:

> *"Similar to generation costs, transmission costs in the Phase 1 analysis will be calculated as the levelized cost of transmission ("LCOT"). This includes the cost of any transmission network infrastructure upgrades required to interconnect with the grid, and also all wheeling charges (transmission access charge for CAISO) to deliver the energy. The cost of connecting the generating project to the grid (or "gen-tie" cost) is part of the facility costs and will be included in the generation cost of the project. The LCOT for a project is the total cost of transmission upgrades normalized by the total generation from the facility and is calculated in terms of ($/MWh). Wheeling costs are to be added to the network costs."*

We find the methodology presented to identify upgrades and their cost to be, at best, very vague. The methodology to evaluate wheeling charges is equally vague. Both these methodologies should be further clarified.

4. The report states that:

> *"Not all renewable projects identified will be assigned to a CREZ. An individual project will not be designated a CREZ, even if it is transmission constrained, since no cost efficiencies would result. Further, projects which do not benefit economically from being grouped with other projects will not be forced into a CREZ."*

We would like to know what specific criteria will be used to exclude projects in the same general vicinity from being included in a CREZ.

5. The Phase 1A draft report representation of the projects in the CAISO queue seems to be inaccurate and needs to be corrected.

6. The report states that:

> *"[T]he [wind] data is modeled for 50 meters above the ground level, while most new wind farms have a hub height of 80 meters or more."*

The minimum hub heights of new wind turbines are 80 meters, and some are now doing 105 meters. We believe that AWS TruWind has 70 and 100 meter data available for the geography covered by RETI, and anything done to project the future should not use less than 100 meters. The 1/7 power law does not work in many places, and nothing but the best available data should be used. This will cause the analysis to miss some key locations that could contribute in a significant way to the CA RPS market. Even if better modeling data is used, however, it does not substitute for actual wind resource measurements at a particular site.

7. The Phase 1A draft report indicates that it uses constant numbers for financing, which ignores risk and scale and will not accurately represent actual development capabilities.

8. Storage technologies, including CAES based technologies such as those employed by General Compression's dispatchable wind power system (DWPS), have the potential to firm wind projects and/or new create peaking and baseload wind projects that fully utilize existing transmission, reduce the levelized cost of new transmission, and deliver both capacity and load following green energy to the grid. Porous media that support CAES such as oil & gas reservoirs (depleted) and saline aquifers, or large salt deposits, should be evaluated for proximity to REZs. Such features would effectively increase the value of a given REZ by raising the achievable average capacity factor for renewable resources in that zone.
9. A capacity value of $204/kw-year has been assumed based on CEC defined CEC calculations for gas turbines. Is B&V assuming a CCGT and can the detail on such assumptions/calculations be provided?
10. The references pertaining to British Columbia's wind potential used in compiling the information in the report may be outdated. There have been two studies completed by Garrad Hassan for BC Hydro since the Helimax Energy Inc. study of 2002. The 2007 Garrad Hassan study entitled: “Assessment of the Energy Potential and Estimated Costs of Wind Energy in British Columbia” estimated that the total estimated developable wind potential in BC is on the order of 5,400 MW, which is larger than the 4,790 MW figure from Helimax.
11. It is suggested that the Phase IA report make use of BLM's Geo-communicator, which shows renewable energy right of ways on BLM lands: http://www.geocommunicator.gov/GeoComm/index.shtm.